

# Wattle Application on Linear Projects



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## What is a Wattle?

- Anatomical definition\* – a fleshy growth hanging from the head or neck of certain animals.



- Construction definition\* – woven strips of wood forming panels used for fencing or for walling.



\* – definitions from Wikipedia

## NCDOT Wattle Definition

- ▶ NCDOT definition – tubular product consisting of excelsior or coir (coconut) fibers encased in synthetic netting.



## Types of Wattles

- ▶ Straw – NCDOT does not use
- ▶ Excelsior
- ▶ Coir/Coconut Fiber
- ▶ Compost – New to NCDOT
- ▶ Synthetic – No NCDOT experience

## Excelsior vs. Coir Fiber

### Excelsior

- ▶ Inner Material: Curled Wood
- ▶ Diameter: 12 in. – 20 in.
- ▶ Length: 10 ft.

### Coir Fiber

- ▶ Inner Material: Coconut Fibers
- ▶ Diameter: 12 in. – 20 in.
- ▶ Length: 10 ft.

## Excelsior vs. Coir Fiber

### Excelsior

- ▶ Density: 2.5 lb./ft.<sup>3</sup>
- ▶ Design Life: 1 year
- ▶ Average Cost: \$6.00 per ft.  
(Includes material, labor and equipment costs - NCDOT)

### Coir Fiber

- ▶ Density: 3.5 lb./ft.<sup>3</sup>
- ▶ Design Life: >2 years
- ▶ Average Cost: \$8.50 per ft.  
(Includes material, labor and equipment costs - NCDOT)

## Linear Project Wattle Applications

- ▶ Ditches for Polyacrylamide (PAM) Incorporation
- ▶ Drainage Breaks in Silt Fence
- ▶ Perimeter Barriers in lieu of Silt Fence
- ▶ Slope Breaks and Runoff Diversions
- ▶ Inlet Protection

## Wattles on Erosion Control Plans

- ▶ Ditchline Wattle

Without PAM



With PAM



- ▶ Excelsior Wattle Break and Barrier

— EW —

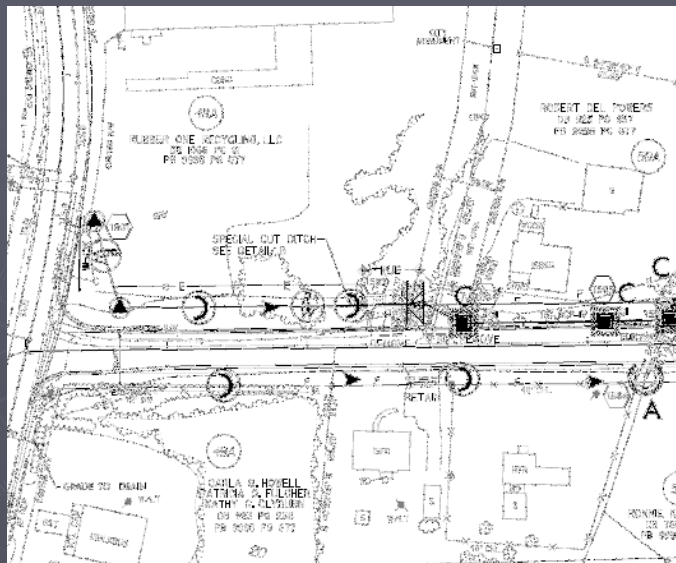
- ▶ Coir Fiber Wattle Break and Barrier

— CFW —

## Ditch Wattle Design Info

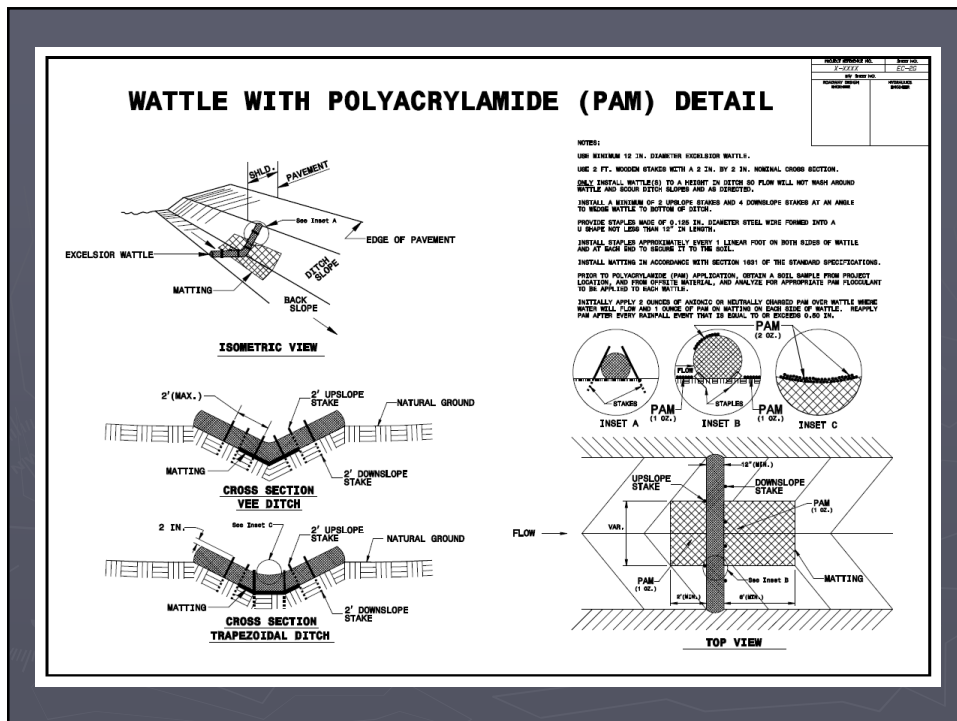
- ▶ Wattles Primarily Used for PAM(powder) Incorporation
- ▶ Wattles not used for:
  - Sediment Storage
  - Velocity Control
  - Vegetation Establishment
- ▶ Used in Ditch Grades  $< 2.5\%$
- ▶ Placed in Temporary and Permanent Ditches

## Wattles in Ditchlines on EC Plans



# Ditch Installation

1. Place Matting
2. Install Wattle and Staples on Matting
3. Install 2 Upslope Stakes and 4 Downslope Stakes
4. Apply 1 oz. of PAM Downstream and Upstream and 2 oz. on Wattle (Total of 4 oz.)



## Excelsior Wattle

- ▶ Can be used with or without PAM
- ▶ When utilized, place wattles every 50 ft. in temporary and/or permanent ditches
- ▶ Use Excelsior Wattles on short term projects (one year project duration or less)

## Excelsior Wattle





## Excelsior Wattle



## Excelsior Wattle in Median





## Coir Fiber Wattle

- ▶ Can be used with or without PAM
- ▶ When utilized, place coir wattles every 50 ft. in temporary and/or permanent ditches
- ▶ Use Coir Fiber Wattles on long term projects (project duration of more than a year)

## Coir Fiber Wattle



## Coir Fiber Wattle



## Coir Fiber Wattles in Temporary Diversion



## Silt Fence Wattle Breaks



Design - Utilized on Clearing & Grubbing and Final Grade Phases of Erosion Control Plans

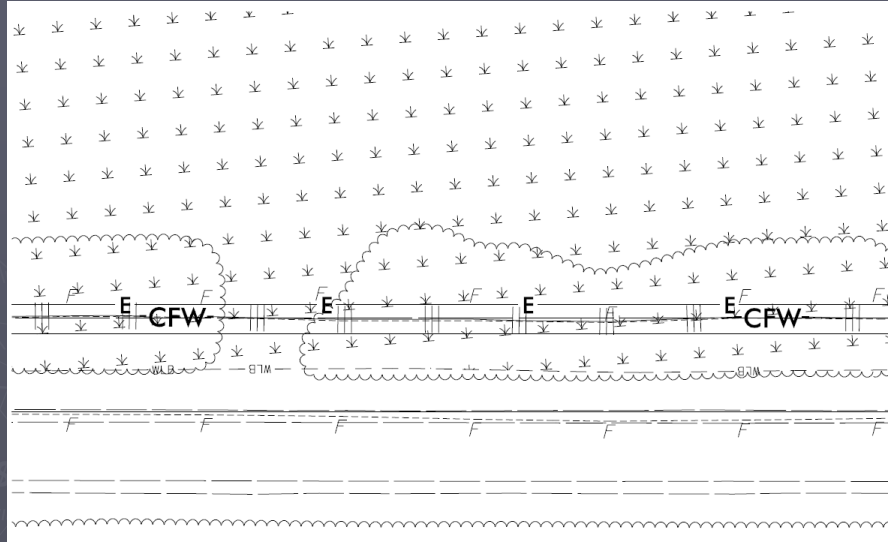
Placement – Between Silt Fence Segments

Function – Wattle provides a drainage break for Silt Fence Sections in Low Areas

## Wattle Break Design

- ▶ Design for Wattle of 10 ft. in length
- ▶ Can be used in wetlands, easy to remove (or not!)
- ▶ Maximum Spacing of 200 ft.
- ▶ Use Coir Fiber Wattles (CFW) for projects > 1 year

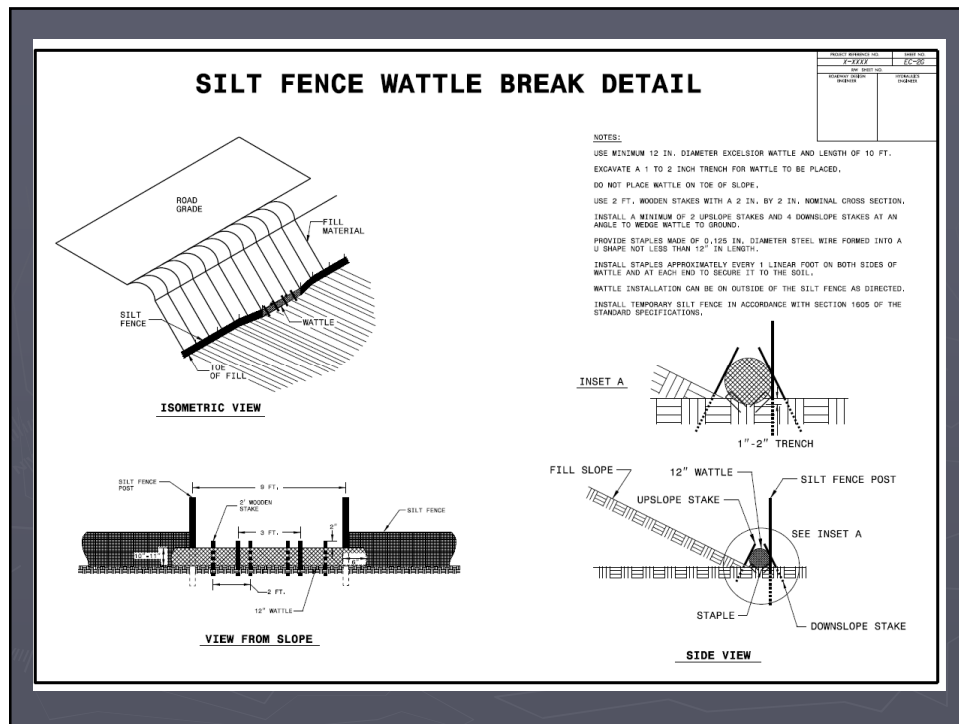
## Wattle Breaks in Silt Fence on Plans



## Silt Fence Break Installation

1. Leave 9 ft. gap in Silt Fence
2. Excavate 1" to 2" trench to the inside of Silt Fence
3. Place Wattle and Staples in trench
4. Install 2 Upslope Stakes and 4 Downslope Stakes





## Wattle Break in Silt Fence



## Wattle Break in Silt Fence



## Wattle Barrier



Design - Utilized on Clearing & Grubbing and Final Grade Phases of Erosion Control Plans

Placement - At the toe of bridge approach fill slopes

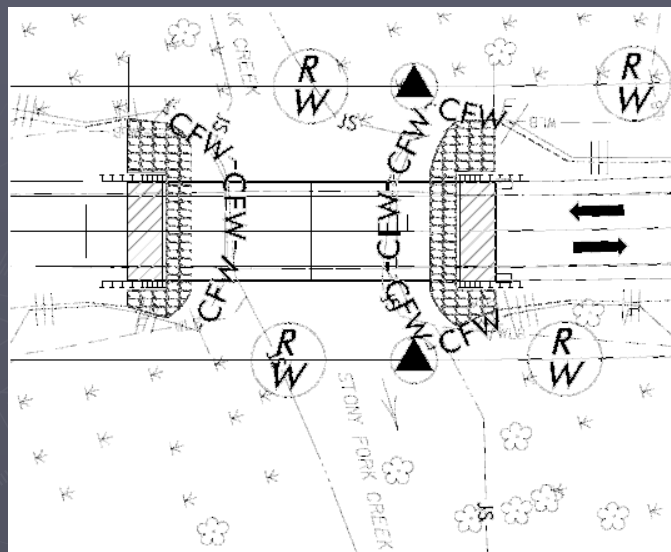
Function - Wattle Barrier temporarily traps sheet flow from disturbed slopes allowing sediment to settle on the flow side



## Wattle Barrier Design

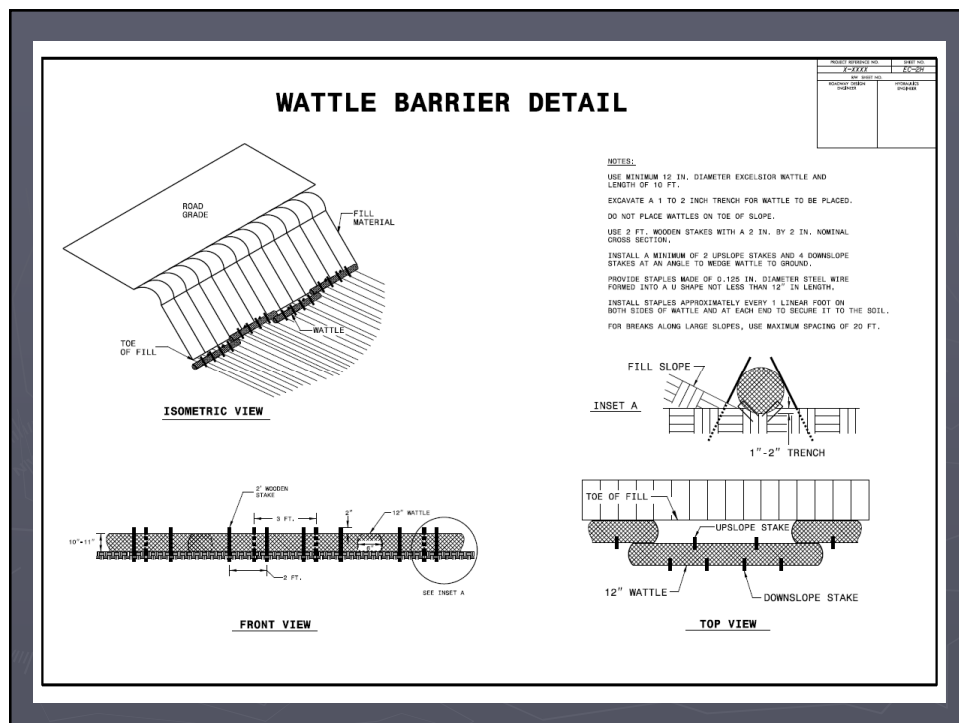
- ▶ Utilize where Silt Fence can't be installed (<4 ft.)
- ▶ Can be used in wetlands, easy to remove (or not!)
- ▶ Maximum Spacing of 20 ft. for breaks on slopes
- ▶ Use Coir Fiber Wattles (CFW) for projects > 1 year
- ▶ Consider >12" as Perimeter Measure

## Wattle Barrier on EC Plans



# Wattle Barrier Installation

1. Excavate 1" to 2" trenches in alternating pattern
2. Place Wattles and Staples in trenches
3. Make sure Wattles overlap at least 6"
4. Install 2 Upslope Stakes and 4 Downslope Stakes



## Perimeter Wattle Barrier



## Wattle Barrier



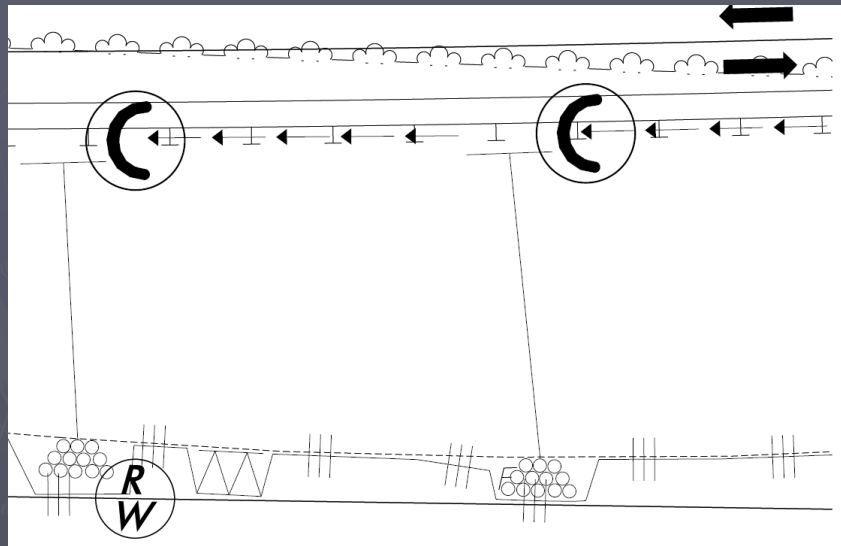
## Wattles as Slope Break



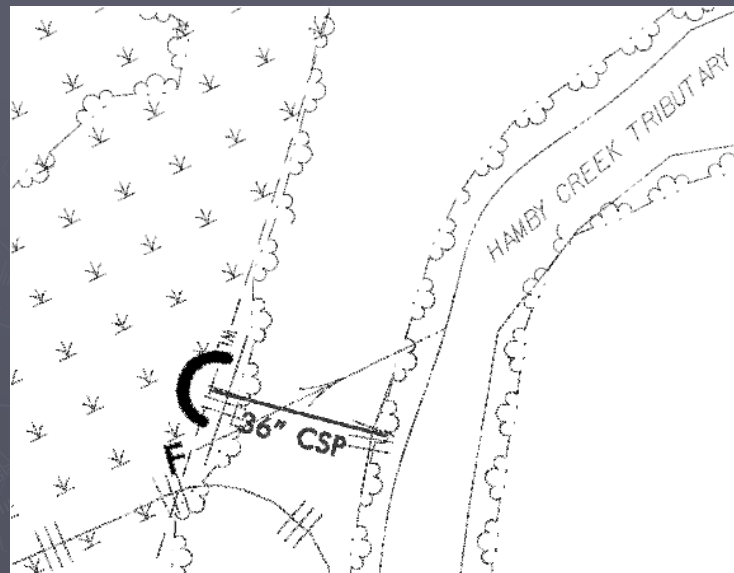
## Wattles for Runoff Diversion



## Wattle w/ PAM at Slope Drains



## Wattle as Pipe Inlet Protection





## Wattle Inlet Protection



## Wattle Inlet Protection





## Wattle Locations for PAM

- ▶ Upstream locations that drain to:
  - Silt Fence
  - Sediment Basin or Trap
  - Rock Dam or Inlet Protection
- ▶ Inlet to Sediment Basins
- ▶ Inlets to Slope Drains

## Wattle Locations NOT for PAM

- ▶ Jurisdictional Areas
  - Streams
  - Wetlands
  - Ponds
- ▶ Perimeter Measure
- ▶ Outlets of Ditches
- ▶ Drainage Inlets Carrying Flow Directly Offsite

## Scour Underneath Wattle



## Scour Underneath Wattle



## Wattle not Stapled Adequately



## Wattle Overkill!





## Stacked Wattles



## Wattle Application Summary

- ▶ Use Wattles for PAM Incorporation (upstream only!)
- ▶ Wattles can be used at Perimeter (No PAM!)
- ▶ Can provide extra Velocity Control & Sediment Storage
- ▶ Easier Removal and Disposal than Stone

## Wattle Web Resources

- Wattle Construction Specifications:

[http://www.ncdot.gov/doh/operations/dp\\_chief\\_eng/roadside/soil\\_water/special\\_provisions/](http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/special_provisions/)

- Wattle Construction Details:

[http://www.ncdot.gov/doh/operations/dp\\_chief\\_eng/roadside/soil\\_water/details/](http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/details/)

- NCDOT Erosion Control Pocket Field Guide

[http://www.ncdot.gov/doh/operations/dp\\_chief\\_eng/roadside/soil\\_water/pdf/fieldguide2013\\_WEB.pdf](http://www.ncdot.gov/doh/operations/dp_chief_eng/roadside/soil_water/pdf/fieldguide2013_WEB.pdf)

## Questions?



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